



# TEST REPORT

**Reference No.** : WTX25X03046113W004  
**Manufacturer** : Lumi United Technology Co., Ltd.  
**Address** : Room 801-804, Building 1, Chongwen Park, Nanshan iPark, No. 3370, Liuxian Avenue, Fuguang Community, Taoyuan Residential District, Nanshan District, Shenzhen, China  
**Product Name** : Camera G100  
**Model No.** : CH-C08E  
**Standards** : EN 55032:2015+A1:2020; EN 55035:2017+A11:2020  
EN IEC 61000-3-2:2019+A2:2024  
EN 61000-3-3:2013+A2:2021+AC:2022-01  
ETSI EN 301 489-1 V2.2.3 (2019-11)  
ETSI EN 301 489-17 V3.3.1 (2024-09)  
**Date of Receipt sample** : 2025-03-04  
**Date of Test** : 2025-03-04 to 2025-03-25  
**Date of Issue** : 2025-03-25  
**Test Report Form No.** : WTX\_ESI EN 301 489\_1\_2019W  
**Test Result** : Pass

**Remarks:**

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of approver.

**Prepared By:**

**Waltek Testing Group (Shenzhen) Co., Ltd.**

Address: 1/F., Room 101, Building 1, Hongwei Industrial Park, Liuxian 2nd Road,  
Block 70 Bao'an District, Shenzhen, Guangdong, China

Tel.: +86-755-33663308 Fax.: +86-755-33663309 Email: sem@waltek.com.cn

**Tested by:**

Dashan Chen/Project Engineer

**Approved by:**

Jason Su/Manager



## **TABLE OF CONTENTS**

<b>1. GENERAL INFORMATION .....</b>	<b>5</b>
1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT).....	5
1.2 TEST STANDARDS.....	7
1.3 TEST METHODOLOGY.....	7
1.4 TEST FACILITY .....	8
1.5 EUT SETUP AND OPERATION MODE .....	9
1.6 PERFORMANCE CRITERIA FOR EMS .....	10
1.7 MEASUREMENT UNCERTAINTY .....	12
1.8 TEST EQUIPMENT LIST AND DETAILS .....	13
<b>2. SUMMARY OF TEST RESULTS .....</b>	<b>17</b>
<b>3. CONDUCTED EMISSIONS .....</b>	<b>18</b>
3.1 TEST PROCEDURE.....	18
3.2 BASIC TEST SETUP BLOCK DIAGRAM.....	18
3.3 ENVIRONMENTAL CONDITIONS .....	18
3.4 CONDUCTED EMISSIONS TEST DATA.....	18
<b>4. RADIATED EMISSIONS.....</b>	<b>21</b>
4.1 TEST PROCEDURE.....	21
4.2 CORRECTED AMPLITUDE & MARGIN CALCULATION.....	21
4.3 ENVIRONMENTAL CONDITIONS .....	22
4.4 SUMMARY OF TEST RESULTS/PLOTS .....	22
<b>5. HARMONIC CURRENT EMISSIONS .....</b>	<b>26</b>
5.1 TEST PROCEDURE.....	26
5.2 TEST SETUP BLOCK DIAGRAM .....	26
5.3 TEST STANDARDS.....	26
5.4 ENVIRONMENTAL CONDITIONS .....	26
5.5 HARMONIC CURRENT EMISSIONS TEST DATA.....	26
<b>6. VOLTAGE FLUCTUATION AND FLICKER .....</b>	<b>27</b>
6.1 TEST PROCEDURE.....	27
6.2 TEST SETUP BLOCK DIAGRAM .....	27
6.3 TEST STANDARDS.....	27
6.4 ENVIRONMENTAL CONDITIONS .....	27
6.5 VOLTAGE FLUCTUATION AND FLICKER TEST DATA.....	27
<b>7. ELECTROSTATIC DISCHARGE (ESD) .....</b>	<b>29</b>
7.1 TEST PROCEDURE.....	29
7.2 TEST SETUP BLOCK DIAGRAM .....	29
7.3 TEST PERFORMANCE .....	29
7.4 ENVIRONMENTAL CONDITIONS .....	29
7.5 ELECTROSTATIC DISCHARGE IMMUNITY TEST DATA.....	29
<b>8. RADIO FREQUENCY ELECTROMAGNETIC FIELD (R/S) .....</b>	<b>31</b>
8.1 TEST PROCEDURE.....	31
8.2 TEST SETUP BLOCK DIAGRAM .....	31
8.3 TEST PERFORMANCE .....	31
8.4 ENVIRONMENTAL CONDITIONS .....	31
8.5 CONTINUOUS RADIATED DISTURBANCES TEST DATA.....	31
<b>9. FAST TRANSIENTS, COMMON MODE (EFT) .....</b>	<b>33</b>
9.1 TEST PROCEDURE.....	33
9.2 TEST SETUP BLOCK DIAGRAM .....	33
9.3 TEST PERFORMANCE .....	33
9.4 ENVIRONMENTAL CONDITIONS .....	33
9.5 ELECTRICAL FAST TRANSIENTS TEST DATA .....	33



<b>10. SURGES .....</b>	<b>35</b>
10.1 TEST PROCEDURE.....	35
10.2 TEST SETUP BLOCK DIAGRAM .....	35
10.3 TEST PERFORMANCE .....	35
10.4 ENVIRONMENTAL CONDITIONS .....	35
10.5 SURGE TEST DATA .....	35
<b>11. RADIO FREQUENCY, COMMON MODE (C/S) .....</b>	<b>37</b>
11.1 TEST PROCEDURE.....	37
11.2 TEST SETUP BLOCK DIAGRAM .....	37
11.3 TEST PERFORMANCE .....	37
11.4 ENVIRONMENTAL CONDITIONS .....	37
11.5 CONTINUOUS CONDUCTED DISTURBANCES TEST DATA .....	37
<b>12. VOLTAGE DIPS AND INTERRUPTIONS.....</b>	<b>39</b>
12.1 TEST PROCEDURE.....	39
12.2 TEST SETUP BLOCK DIAGRAM .....	39
12.3 TEST PERFORMANCE .....	39
12.4 ENVIRONMENTAL CONDITIONS .....	39
12.5 VOLTAGE DIPS AND INTERRUPTIONS TEST DATA .....	39
<b>EXHIBIT 1 - EUT PHOTOGRAPHS.....</b>	<b>40</b>
<b>EXHIBIT 2 - TEST SETUP PHOTOGRAPHS .....</b>	<b>41</b>

# WALTEK



## Report version

Version No.	Date of issue	Description
Rev.00	2025-03-25	Original
/	/	/

# WALTEK



## 1. GENERAL INFORMATION

### 1.1 Product Description for Equipment Under Test (EUT)

General Description of EUT	
Product Name:	Camera G100
Trade Name:	Aqara
Model No.:	CH-C08E
Adding Model(s):	CH-C08D
Rated Voltage:	DC5V
Battery Capacity:	/
Power Adapter:	/
Software Version:	4.3.6_0020
Hardware Version:	01A-1
<i>Note: The test data is gathered from a production sample, provided by the manufacturer. The appearance of others models listed in the report is different from main-test model CH-C08E, but the circuit and the electronic construction do not change, declared by the manufacturer.</i>	



<b>Technical Characteristics of EUT</b>	
<b>Bluetooth</b>	
Bluetooth Version:	Bluetooth V5.2(BLE Mode)
Frequency Range:	2402MHz-2480MHz
Max.RF Output Power:	1Mbps: 3.54dBm (EIRP) 2Mbps: 3.61dBm (EIRP)
Type of Modulation:	GFSK
Data Rate:	1Mbps, 2Mbps
Quantity of Channels	40
Channel Separation:	2MHz
Type of Antenna:	FPC Antenna
Antenna Gain:	1.94dBi
<b>Wi-Fi(2.4GHz)</b>	
Support Standards:	802.11b, 802.11g, 802.11n-HT20/40, 802.11ax-HE20/40
Frequency Range:	2412-2472MHz for 802.11b/g/n/ax(HT/HE20) 2422-2462MHz for 802.11n/ax(HT/HE40)
Max.RF Output Power:	16.96dBm (EIRP)
Type of Modulation:	CCK, OFDM, QPSK, BPSK, 16QAM, 64QAM
Quantity of Channels	13 for 802.11b/g/n(HT20) 9 for 802.11n(HT40)
Channel Separation:	5MHz
Type of Antenna:	FPC Antenna
Antenna Gain:	1.94dBi

*Note: The Antenna Gain is provided by the customer and can affect the validity of results.*



## 1.2 Test Standards

The tests were performed according to following standards:

**EN 55032:2015+A1:2020:** Electromagnetic compatibility of multimedia equipment - Emission requirements

**EN 55035:2017+A11:2020:** Electromagnetic compatibility of multimedia equipment - Immunity requirements.

**EN IEC 61000-3-2:2019+A2:2024:** Electromagnetic compatibility (EMC) -- Part 3-2: Limits - Limits for harmonic current emissions (equipment input current up to and including 16 A per phase).

**EN 61000-3-3:2013+A2:2021+AC:2022-01:** Electromagnetic compatibility (EMC) -- Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current <= 16 A per phase and not subject to conditional connection.

**ETSI EN 301 489-1 V2.2.3 (2019-11):** Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard for Electromagnetic Compatibility.

**ETSI EN 301 489-17 V3.3.1 (2024-09):** ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for Broadband and Wideband Data Transmission Systems; Harmonised Standard for ElectroMagnetic Compatibility.

**Maintenance of compliance** is the responsibility of the manufacturer. Any modification of the product maybe which result in lowering the emission/immunity should be checked to ensure compliance has been maintained.

## 1.3 Test Methodology

All measurements contained in this report were conducted with the standard ETSI EN 301489-1, Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements.



## 1.4 Test Facility

### Address of the test laboratory

Laboratory: Waltek Testing Group (Shenzhen) Co., Ltd.

Address: 1/F., Room 101, Building 1, Hongwei Industrial Park, Liuxian 2nd Road, Block 70 Bao'an District, Shenzhen, Guangdong, China

### FCC – Registration No.: 125990

Waltek Testing Group (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. The Designation Number is CN5010, and Test Firm Registration Number is 125990.

### Industry Canada (IC) Registration No.: 11464A

The 3m Semi-anechoic chamber of Waltek Testing Group (Shenzhen) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.

**WALTEK**



## 1.5 EUT Setup and Operation Mode

The equipment under test (EUT) was configured to measure its highest possible emission/immunity level. The test modes were adapted according to the operation manual for use, more detailed description as follows:

<b>Test Mode List</b>			
Test Mode	Description	Remark	
TM1	Normal working	Connect to the Adapter; AC230V 50Hz for Adapter	
TM2	Wi-Fi (2.4GHz)	TR, CR, TT, CT for EMS testing	
TM3	Bluetooth	TR, CR, TT, CT for EMS testing	

<b>EUT Cable List and Details</b>			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
USB Cable	1.5	Unshielded	Without Ferrite

<b>Special Cable List and Details</b>			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

<b>Auxiliary Equipment List and Details</b>			
Description	Manufacturer	Model	Serial Number
Adapter	Baseus	CCCJGCC-S	/



## 1.6 Performance Criteria for EMS

- EN 301 489-17, The performance criteria are:

- performance criteria A for immunity tests with phenomena of a continuous nature;
- performance criteria B for immunity tests with phenomena of a transient nature;
- performance criteria C for immunity tests with power interruptions exceeding a certain time.

The equipment shall meet the minimum performance criteria as specified in the following clauses.

Table 1: Performance criteria

Criteria	During test	After test
A	Shall operate as intended. (see note 1). Shall be no loss of function. Shall be no unintentional transmissions.	Shall operate as intended. Shall be no degradation of performance (see note 3). Shall be no loss of function. Shall be no loss of stored data or user programmable
B	May show loss of function (one or more). May show degradation of performance (see note 2). Shall be no unintentional transmissions.	Functions shall be self-recoverable. Shall operate as intended after recovering. Shall be no degradation of performance (see note 3). Shall be no loss of stored data or user programmable functions.
C	May be loss of function (one or more).	Functions shall be recoverable by the operator. Shall operate as intended after recovering. Shall be no degradation of performance (see note 3).



**NOTE 1:** Operate as intended during the test allows a level of degradation not below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.

**NOTE 2:** Degradation of performance during the test is understood as a degradation to a level not below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.

**NOTE 3:** No degradation of performance after the test is understood as no degradation below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. After the test no change of actual operating data or user retrievable data is allowed. If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.

➤ **EN 55035, The performance criteria are:**

- A. The apparatus shall continue to operate as intended during and after the test. The manufacturer specifies some minimum performance level. The performance level may be specified by the manufacturer as a permissible loss of performance.
- B. The apparatus shall continue to operate as intended after the test. This indicates that the EUT does not need to function at normal performance levels during the test, but must recover. Again some minimal performance is defined by the manufacturer. No change in operating state or loss or data is permitted.
- C. Temporary loss of function is allowed. Operation of the EUT may stop as long as it is either automatically reset or can be manually restored by operation of the controls.



## 1.7 Measurement Uncertainty

<b>Measurement uncertainty</b>	
<b>Parameter</b>	<b>Uncertainty</b>
Uncertainty for Radiated Emission in 3m chamber	@30-200MHz, 4.52dB @0.2-1GHz, 5.56dB @1-6GHz, 3.84dB @6-18GHz, 3.92dB
Uncertainty for Conducted Emission	@9-150kHz , 3.74dB @0.15-30MHz, 3.34dB
Uncertainty for Harmonic test	3.26%
Uncertainty for Flicker test	4.76%
Uncertainty for RS test	21%, k=2
Uncertainty for CS test	29%, k=2
Uncertainty for ESD test	The immunity measurement system uncertainty is within standard requirement and is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%.
Uncertainty for EFT test	
Uncertainty for Surges test	
Uncertainty for Voltage Dips, Voltage Variations and Short Interruptions Test	
Uncertainty for PFMF test	



## 1.8 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal Date	Due Date
Universal Radio Communication Tester	Rohde & Schwarz	CMW500	148650	2025-02-23	2026-02-22
<input type="checkbox"/> Chamber A: Below 1GHz					
Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2025-02-23	2026-02-22
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2025-02-23	2026-02-22
Amplifier	HP	8447F	2805A03475	2025-02-23	2026-02-22
Loop Antenna	Schwarz beck	FMZB 1516	9773	2024-02-26	2026-02-25
Trilog Broadband Antenna	Schwarz beck	VULB9163	9163-333	2025-02-23	2026-02-22
Coaxial Cable	/	RC_6G-N-M	/	2025-02-23	2026-02-22
Coaxial Cable	/	RC_6G-N-M	/	2025-02-23	2026-02-22
Coaxial Cable	/	RC_6G-N-M	/	2025-02-23	2026-02-22
<input type="checkbox"/> Chamber A: Above 1GHz					
Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2025-02-23	2026-02-22
Spectrum Analyzer	Rohde & Schwarz	FSP40	100612	2025-02-23	2026-02-22
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2025-02-23	2026-02-22
Amplifier	C&D	PAP-1G18	2002	2025-02-23	2026-02-22
Horn Antenna	ETS	3117	00086197	2025-02-23	2026-02-22
DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2024-03-17	2026-03-16
Pre-amplifier	Schwarzbeck	BBV 9721	9721-031	2025-02-23	2026-02-22
Coaxial Cable	/	C16-07-07	/	2025-02-23	2026-02-22
Coaxial Cable	/	C16-07-07	/	2025-02-23	2026-02-22
Coaxial Cable	/	C16-07-07	/	2025-02-23	2026-02-22
<input checked="" type="checkbox"/> Chamber B:Below 1GHz					
Trilog Broadband Antenna	Schwarz beck	VULB9163(B)	9163-635	2024-03-17	2027-03-16
Amplifier	Agilent	8447D	2944A10457	2025-02-23	2026-02-22
EMI Test Receiver	Rohde & Schwarz	ESPI	101391	2025-02-23	2026-02-22
Coaxial Cable	/	1.5MRFC-LWB3	/	2025-02-23	2026-02-22
Coaxial Cable	/	RG 316	/	2025-02-23	2026-02-22
Coaxial Cable	/	RG 316	/	2025-02-23	2026-02-22
<input checked="" type="checkbox"/> Chamber C:Below 1GHz					
EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2025-02-23	2026-02-22
Trilog Broadband Antenna	Schwarz beck	VULB 9168	1194	2024-04-18	2027-04-17
Loop Antenna	Schwarz beck	FMZB 1516	9773	2024-02-26	2026-02-25



Amplifier	HP	8447F	2944A03869	2025-02-23	2026-02-22
Coaxial Cable	/	RC_6G-N-M	/	2025-02-23	2026-02-22
Coaxial Cable	/	RC_6G-N-M	/	2025-02-23	2026-02-22
Coaxial Cable	/	RC_6G-N-M	/	2025-02-23	2026-02-22
<input checked="" type="checkbox"/> Chamber C: Above 1GHz					
EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2025-02-23	2026-02-22
Horn Antenna	POAM	RTF-118A	1820	2023-03-10	2026-03-09
Amplifier	Tonscend	TAP01018050	AP22E806235	2025-02-23	2026-02-22
DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2024-03-17	2026-03-16
Pre-amplifier	Schwarzbeck	BBV 9721	9721-031	2025-02-23	2026-02-22
Coaxial Cable	/	RC-18G-N-M	/	2025-02-23	2026-02-22
Coaxial Cable	/	RC-18G-N-M	/	2025-02-23	2026-02-22
Coaxial Cable	/	RC-18G-N-M	/	2025-02-23	2026-02-22
<input type="checkbox"/> Conducted Room 1#					
EMI Test Receiver	Rohde & Schwarz	ESCI	100525	2024-12-08	2025-12-07
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2025-02-23	2026-02-22
AC LISN	Schwarz beck	NSLK8126	8126-279	2025-02-23	2026-02-22
8-WIRE ISN CAT5	Schwarz beck	8158	CAT5-8158-0117	2025-02-23	2026-02-22
Coaxial Cable	/	RG 316	/	2025-02-23	2026-02-22
Coaxial Cable	/	6MRFC-DP	/	2025-02-23	2026-02-22
<input checked="" type="checkbox"/> Conducted Room 2#					
EMI Test Receiver	Rohde & Schwarz	ESPI	101259	2025-02-23	2026-02-22
LISN	Rohde & Schwarz	ENV 216	100097	2025-02-23	2026-02-22
Coaxial Cable	/	RG 316	/	2025-02-23	2026-02-22
<input type="checkbox"/> PFMF					
PMF Generator	LIONCEL	PMF-801C-C	0171101	2025-02-23	2026-02-22
PMF Antenna	LIONCEL	PMF-801C-A	0180302	2024-02-24	2025-02-23
Instantaneous PMF Generator Module	LIONCEL	PMF-801C-T	0171001	2025-02-23	2026-02-22
<input checked="" type="checkbox"/> H/F					
Digital Power Analyzer	California Instrument	CTS	72831	2025-02-23	2026-02-22
Power Source	California Instrument	5001IX-CTS-400	60077	2025-02-23	2026-02-22
<input checked="" type="checkbox"/> ESD					
ESD Generator	LIONCEL	ESD-203B	0170901	2025-02-23	2026-02-22
<input checked="" type="checkbox"/> EFT					
EFT Generator	EVERFINE	EMS61000-4A	P635789CS14411 17	2024-11-05	2025-11-04
Couple Clamp	EMC PARTNER	CN-EFT1000	513	2025-02-23	2026-02-22
<input checked="" type="checkbox"/> SURGE					



Surge Generator	EVERFINE	EMS61000-5A	P612004TD14411 12	2025-02-22	2026-02-21
<input type="checkbox"/> Surge signal port					
Surge Generator	EVERFINE	EMS61000-5D	P661587TN14311 13	2025-02-25	2026-02-24
Surge Generator	EVERFINE	EMS61000-5A	P612004TD14411 12	2025-02-22	2026-02-21
Signal Lines CDN	EVERFINE	SGN-5	P619136T0144111 4	2025-02-22	2026-02-21
Telecommunication Lines CDN	EVERFINE	SGN-8	P619137TN14411 12	2025-02-22	2026-02-21
<input checked="" type="checkbox"/> DIPS					
Transient 2000	EMC PARTNER	TRA2000	836	2025-02-23	2026-02-22
<input checked="" type="checkbox"/> CS					
CONDUCTED IMMUNITY TEST SYSTEM	FRANKONIA	CIT-10/75	126B1247/2013	2025-02-23	2026-02-22
Attenuator	EMTEST	MA-5100/6BF2	1009	2025-02-23	2026-02-22
CDN	Luthi	L-801M2/M3	2665	2025-02-23	2026-02-22
CDN	LIONCEL	CDN-T8	0210401	2025-02-23	2026-02-22
EM Clamp	TESEQ	KEMZ801A	45028	2025-02-23	2026-02-22
<input checked="" type="checkbox"/> RS					
Audio Analyzer	Rohde & Schwarz	UPV	1146.2003K02-10 1782-XP	2025-02-23	2026-02-22
Signal Generator	HP	8665B	3438A00604	2025-02-23	2026-02-22
Power Sensor	Agilent	E9301A	MY52450001	2025-02-23	2026-02-22
Power Sensor	Agilent	E9304A	MY55081055	2025-02-23	2026-02-22
RF Power Amplifier	MicoTop	MPA-80-1000-2 50	MPA1906239	2025-02-23	2026-02-22
RF Power Amplifier	MicoTop	MPA-80-6000-1 00	MPA1906238	2025-02-23	2026-02-22
Antenna	SCHWARZBECK	STLP 9129	9129 114	N/A	N/A
Power Meter	Agilent	E4419B	GB42420578	2025-02-23	2026-02-22



Software List			
Description	Manufacturer	Model	Version
EMI Test Software (Radiated Emission A)*	Farad	EZ-EMC	RA-03A1 (1.1.4.2)
EMI Test Software (Radiated Emission B)*	Farad	EZ-EMC	RA-03A1 (1.1.4.2)
EMI Test Software (Radiated Emission C)*	Farad	EZ-EMC	RA-03A1-2 (1.1.4.2)
EMI Test Software (Conducted Emission Room 1#)*	Farad	EZ-EMC	3A1*CE-RE 1.1.4.3
EMI Test Software (Conducted Emission Room 2#)*	Farad	EZ-EMC	3A1*CE-RE 1.1.4.3

\*Remark: indicates software version used in the compliance certification testing.

# WALTEK



## 2. SUMMARY OF TEST RESULTS

Standards	Reference	Description of Test Item	Result
ETSI EN 301 489-1	8.2	Radiated Emissions	Pass
	8.3	Conducted Emissions for DC Power Port	N/A
	8.4	Conducted Emissions for AC Power Port	Pass
	8.5	Harmonic Current Emissions	Pass
	8.6	Voltage Fluctuations and Flicker	Pass
	8.7	Telecommunication Ports	N/A
	9.2	Radio Frequency Electromagnetic Field	Pass
	9.3	Electrostatic Discharge	Pass
	9.4	Fast Transients, Common Mode	Pass
	9.5	Radio Frequency, Common Mode	Pass
	9.6	Transient and Surges in the Vehicular Environment	N/A
	9.7	Voltage Dips and Interruptions	Pass
	9.8	Surges	Pass
Pass: The EUT complies with the essential requirements in the standard. Fail: The EUT does not comply with the essential requirements in the standard. N/A: Not applicable.			

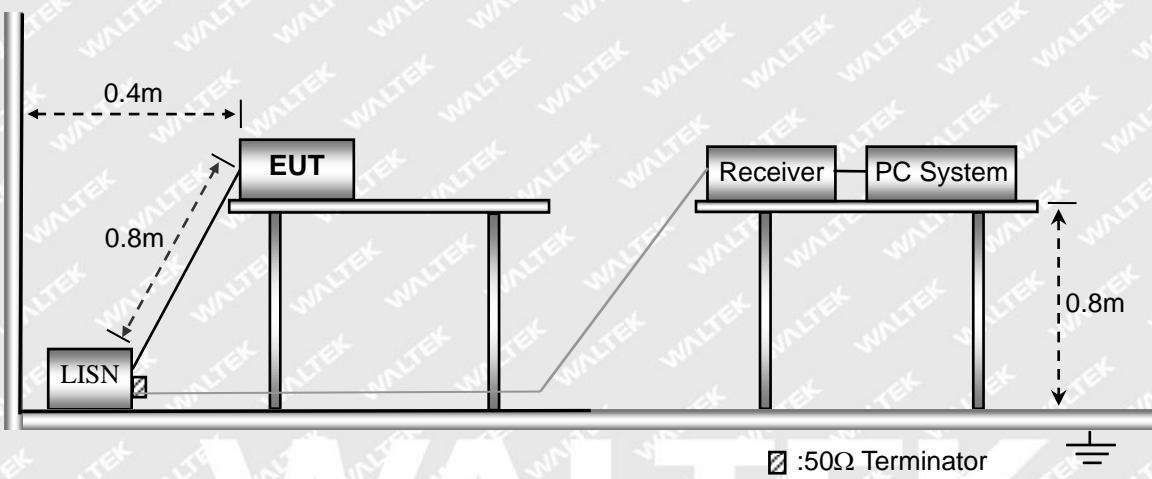


### 3. Conducted Emissions

#### 3.1 Test Procedure

Test is conducting under the description of EN55032 Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement.

#### 3.2 Basic Test Setup Block Diagram



#### 3.3 Environmental Conditions

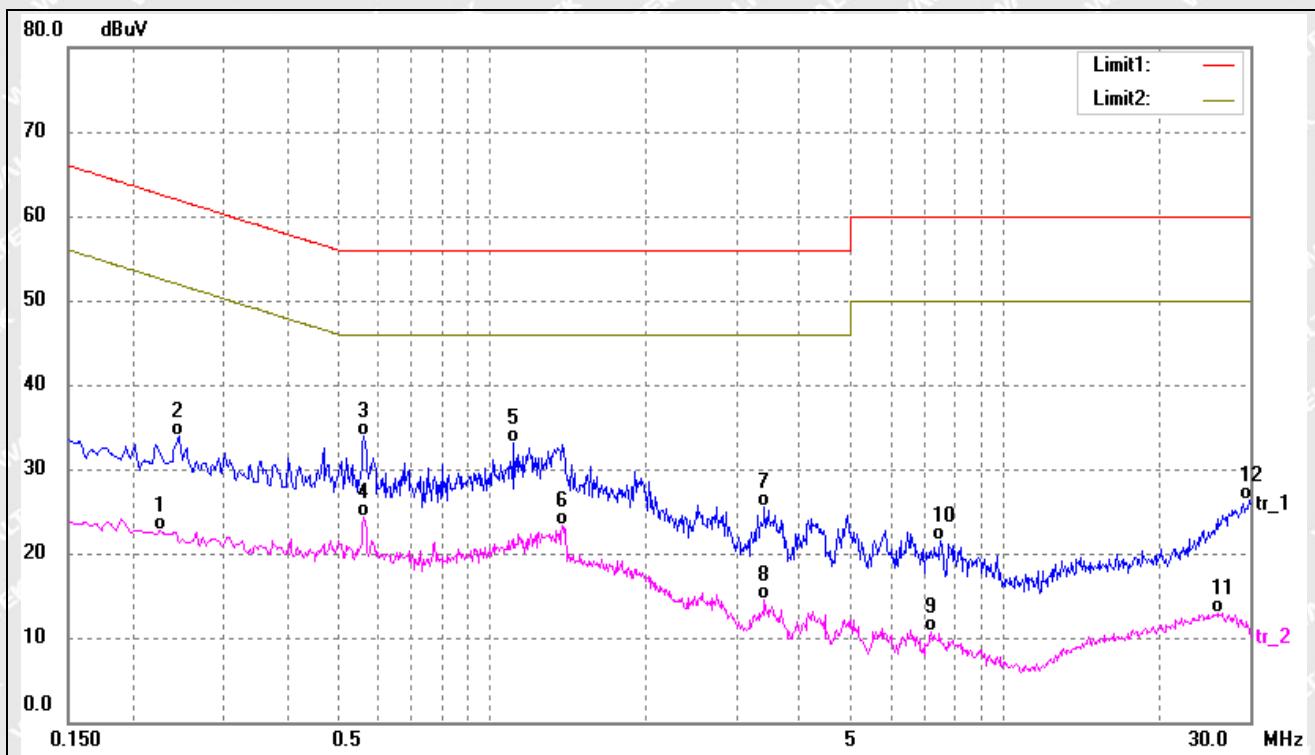
Temperature:	23.5 ° C
Relative Humidity:	54 %
ATM Pressure:	1015 mbar

#### 3.4 Conducted Emissions Test Data

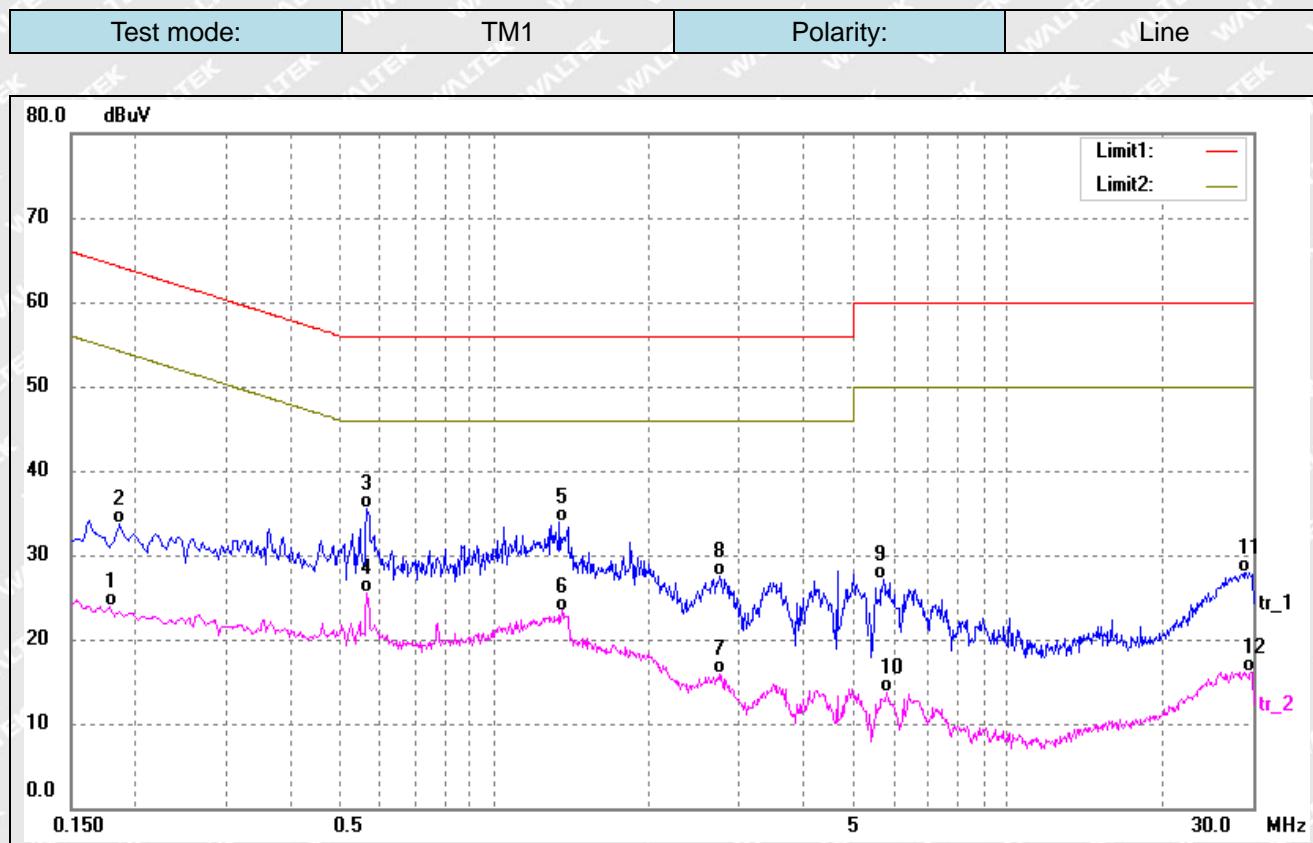
Note: Only show the worst case in the test report



Test mode:	TM1	Polarity:	Neutral
------------	-----	-----------	---------



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2260	13.13	9.59	22.72	52.59	-29.87	AVG
2	0.2460	24.24	9.60	33.84	61.89	-28.05	QP
3	0.5660	24.12	9.73	33.85	56.00	-22.15	QP
4*	0.5660	14.59	9.73	24.32	46.00	-21.68	AVG
5	1.1100	23.38	9.66	33.04	56.00	-22.96	QP
6	1.3740	13.61	9.65	23.26	46.00	-22.74	AVG
7	3.4060	15.86	9.63	25.49	56.00	-30.51	QP
8	3.4060	4.80	9.63	14.43	46.00	-31.57	AVG
9	7.1940	0.83	9.79	10.62	50.00	-39.38	AVG
10	7.5100	11.63	9.80	21.43	60.00	-38.57	QP
11	25.8980	2.91	10.06	12.97	50.00	-37.03	AVG
12	29.8860	16.43	9.92	26.35	60.00	-33.65	QP

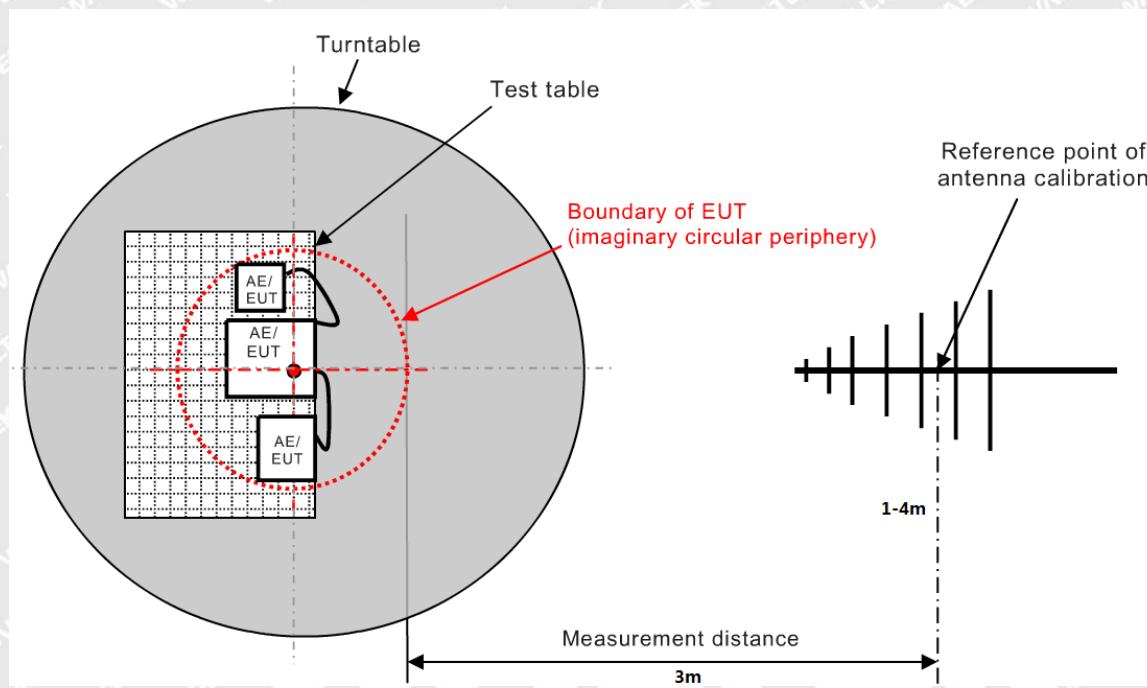


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1780	14.17	9.66	23.83	54.57	-30.74	AVG
2	0.1860	24.10	9.62	33.72	64.21	-30.49	QP
3	0.5660	25.76	9.73	35.49	56.00	-20.51	QP
4*	0.5660	15.79	9.73	25.52	46.00	-20.48	AVG
5	1.3420	24.23	9.65	33.88	56.00	-22.12	QP
6	1.3540	13.75	9.65	23.40	46.00	-22.60	AVG
7	2.7380	6.19	9.62	15.81	46.00	-30.19	AVG
8	2.7580	17.81	9.62	27.43	56.00	-28.57	QP
9	5.7380	17.45	9.74	27.19	60.00	-32.81	QP
10	5.8180	3.99	9.74	13.73	50.00	-36.27	AVG
11	29.1020	17.99	9.95	27.94	60.00	-32.06	QP
12	29.6900	6.23	9.93	16.16	50.00	-33.84	AVG

## 4. Radiated Emissions

### 4.1 Test Procedure

Test is conducting under the description of EN55032 Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement.



### 4.2 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of  $-6\text{dB}\mu\text{V}$  means the emission is  $6\text{dB}\mu\text{V}$  below the maximum limit for Class B device. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{EN 301489 Class B Limit}$$



### 4.3 Environmental Conditions

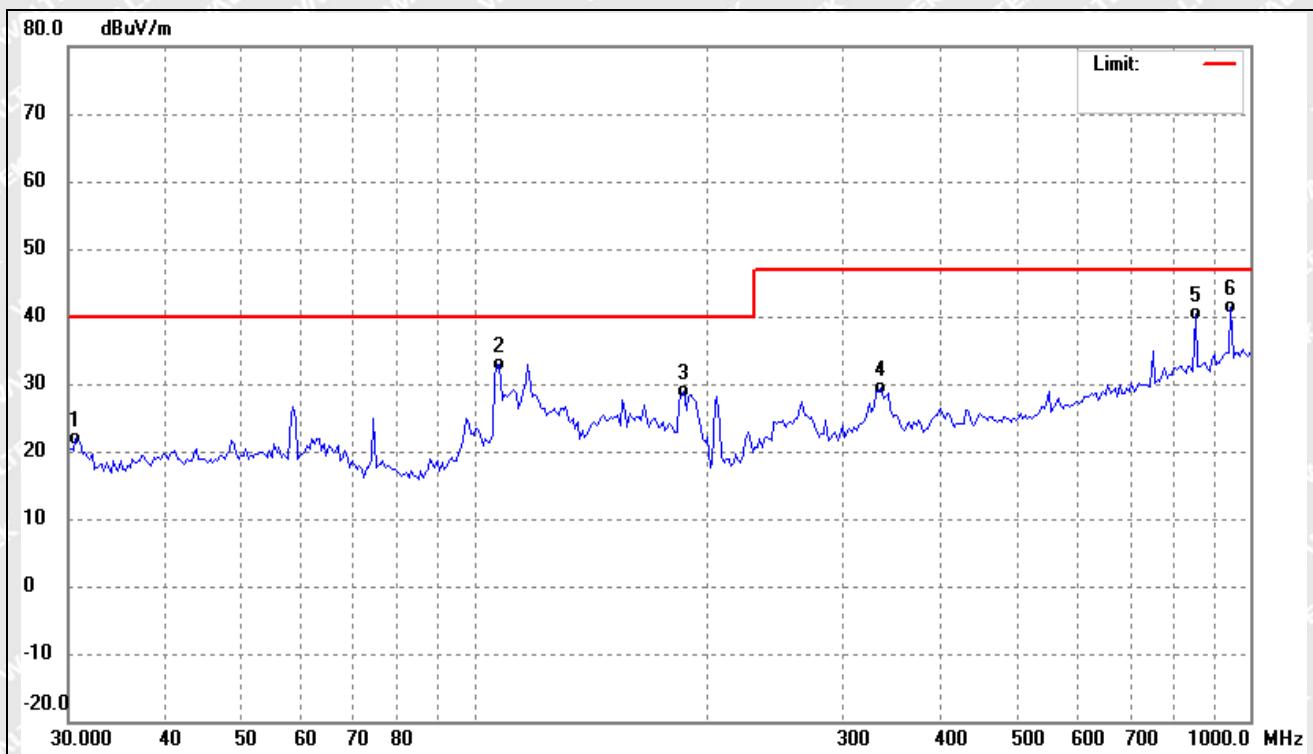
Temperature:	23.5° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

### 4.4 Summary of Test Results/Plots

Note: Only show the worst case in the test report

➤ 30MHz to 1GHz

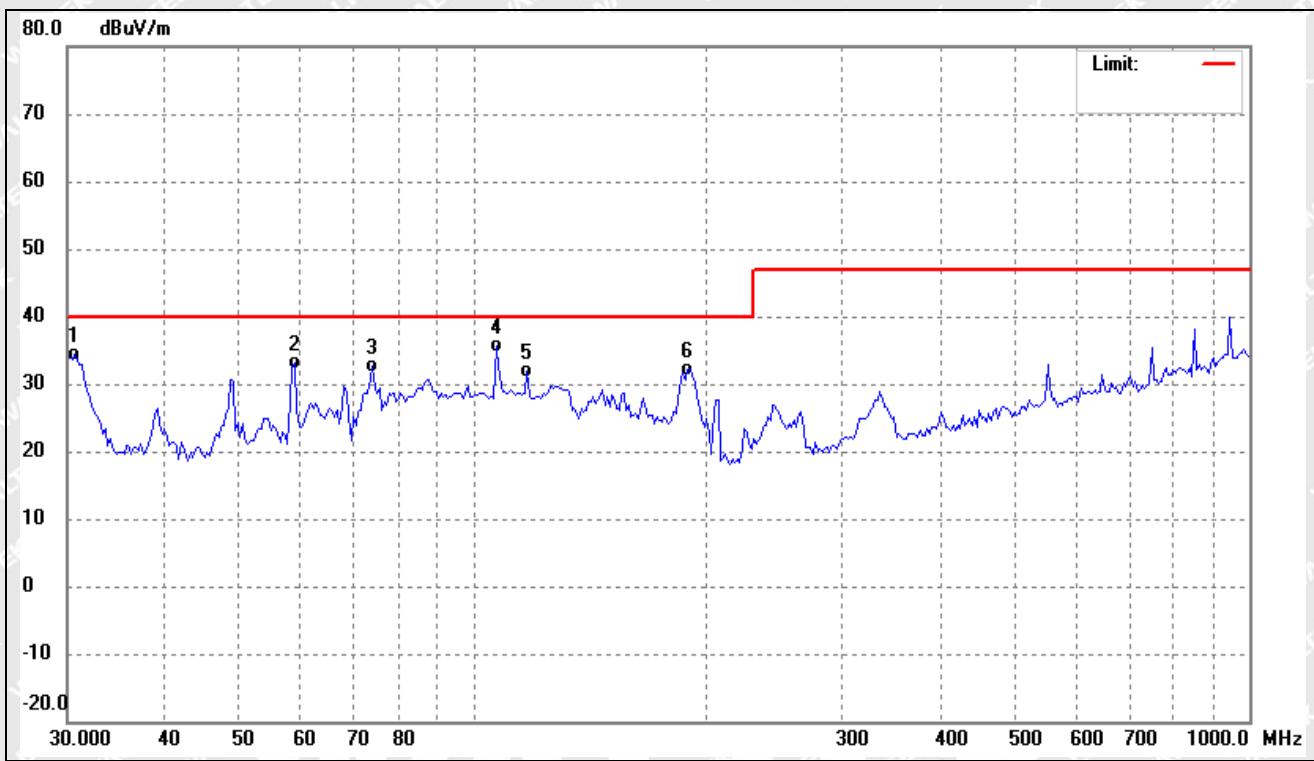
Test mode:	TM1	Polarity:	Horizontal
------------	-----	-----------	------------



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( )	Height (cm)	Remark
1	30.6392	31.54	-9.56	21.98	40.00	-18.02	-	-	QP
2	107.7854	44.25	-11.27	32.98	40.00	-7.02	-	-	QP
3	186.4684	39.28	-10.45	28.83	40.00	-11.17	-	-	QP
4	334.1255	36.55	-7.23	29.32	47.00	-17.68	-	-	QP
5	850.7603	38.72	1.55	40.27	47.00	-6.73	-	-	QP
6	945.3336	38.14	3.19	41.33	47.00	-5.67	-	-	QP



Test mode:	TM1	Polarity:	Vertical
------------	-----	-----------	----------

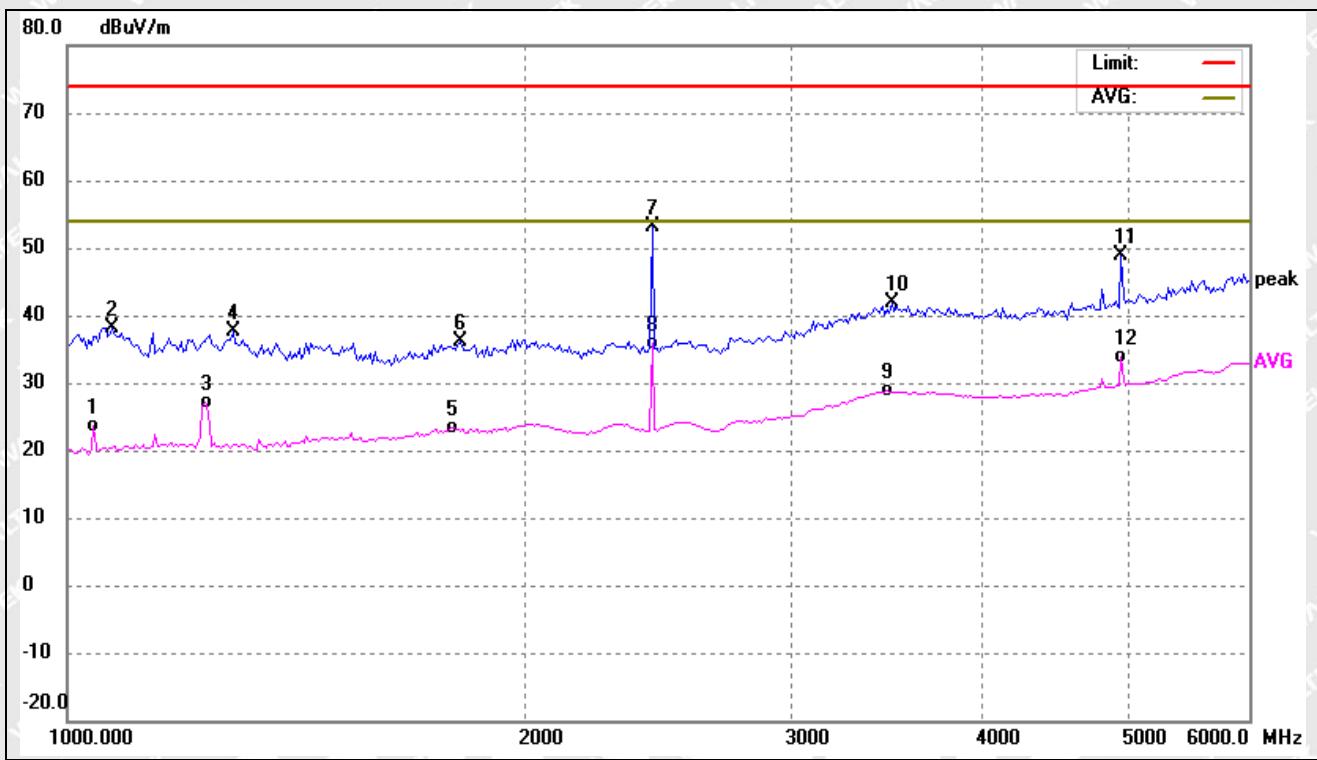


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( )	Height (cm)	Remark
1	30.6392	43.97	-9.56	34.41	40.00	-5.59	-	-	QP
2	58.8979	41.46	-8.36	33.10	40.00	-6.90	-	-	QP
3	74.2696	43.78	-11.18	32.60	40.00	-7.40	-	-	QP
4	107.0306	46.98	-11.34	35.64	40.00	-4.36	-	-	QP
5	117.2686	42.18	-10.30	31.88	40.00	-8.12	-	-	QP
6	189.1076	42.95	-10.73	32.22	40.00	-7.78	-	-	QP



➤ Above 1GHz

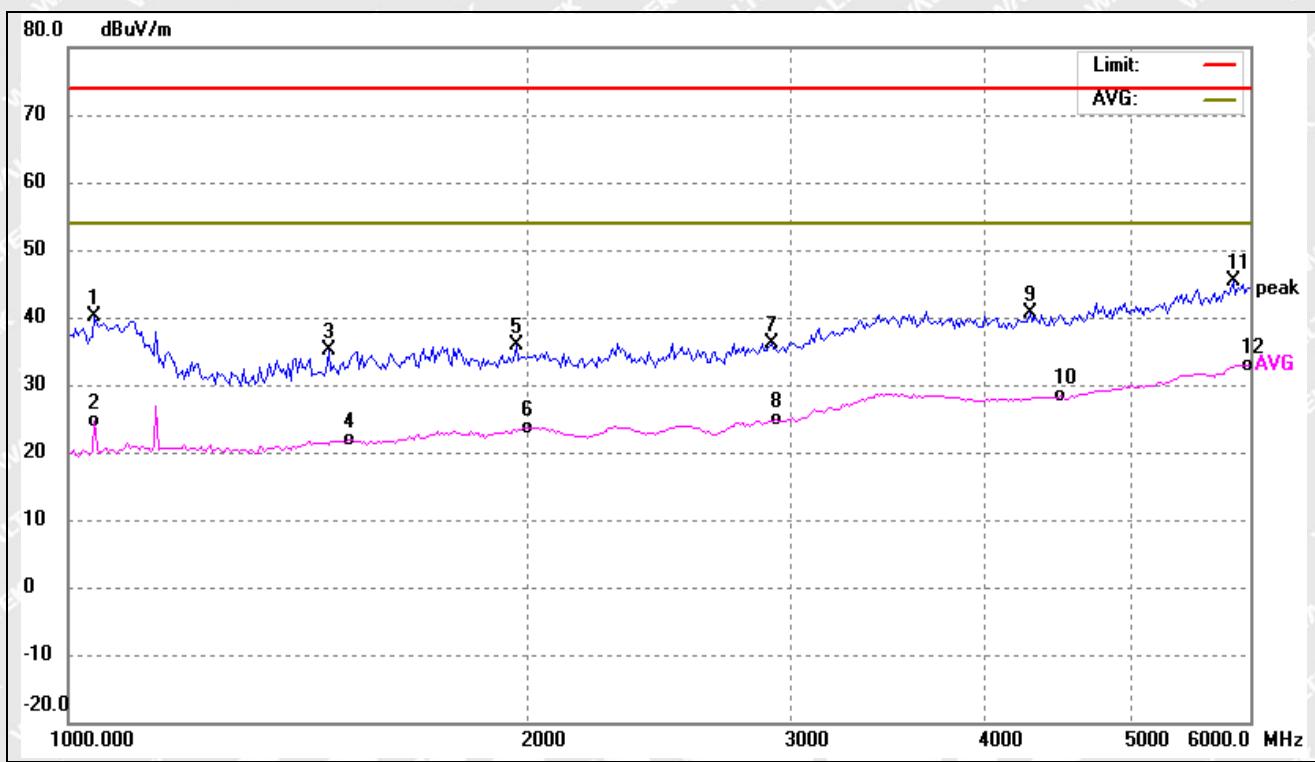
Test mode:	TM1	Polarity:	Horizontal
------------	-----	-----------	------------



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	1040.288	48.56	-24.84	23.72	54.00	-30.28	-	-	AVG
2	1070.604	62.86	-24.63	38.23	74.00	-35.77	-	-	peak
3	1231.534	50.80	-23.62	27.18	54.00	-26.82	-	-	AVG
4	1285.759	60.96	-23.44	37.52	74.00	-36.48	-	-	peak
5	1795.501	44.65	-21.37	23.28	54.00	-30.72	-	-	AVG
6	1814.947	57.31	-21.28	36.03	74.00	-37.97	-	-	peak
7	2427.600	72.49	-19.41	53.08	74.00	-20.92	-	-	peak
8	2427.600	55.25	-19.41	35.84	54.00	-18.16	-	-	AVG
9	3463.856	43.77	-14.99	28.78	54.00	-25.22	-	-	AVG
10	3488.821	56.67	-14.83	41.84	74.00	-32.16	-	-	peak
11	4942.452	62.24	-13.35	48.89	74.00	-25.11	-	-	peak
12	4942.452	47.25	-13.35	33.90	54.00	-20.10	-	-	AVG



Test mode:	TM1	Polarity:	Vertical
------------	-----	-----------	----------



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	1040.288	64.87	-24.84	40.03	74.00	-33.97	-	-	peak
2	1040.288	49.52	-24.84	24.68	54.00	-29.32	-	-	AVG
3	1484.350	57.99	-22.91	35.08	74.00	-38.92	-	-	peak
4	1527.607	44.73	-22.73	22.00	54.00	-32.00	-	-	AVG
5	1971.200	56.35	-20.50	35.85	74.00	-38.15	-	-	peak
6	1999.716	44.10	-20.36	23.74	54.00	-30.26	-	-	AVG
7	2905.013	54.57	-18.33	36.24	74.00	-37.76	-	-	peak
8	2925.951	43.04	-18.28	24.76	54.00	-29.24	-	-	AVG
9	4296.601	55.12	-14.50	40.62	74.00	-33.38	-	-	peak
10	4501.918	42.15	-13.86	28.29	54.00	-25.71	-	-	AVG
11	5851.070	55.22	-9.94	45.28	74.00	-28.72	-	-	peak
12	5957.066	42.60	-9.67	32.93	54.00	-21.07	-	-	AVG

Remark: '-'Means' the test Degree and Height are not recorded by the test software and only show the worst case in the test report.

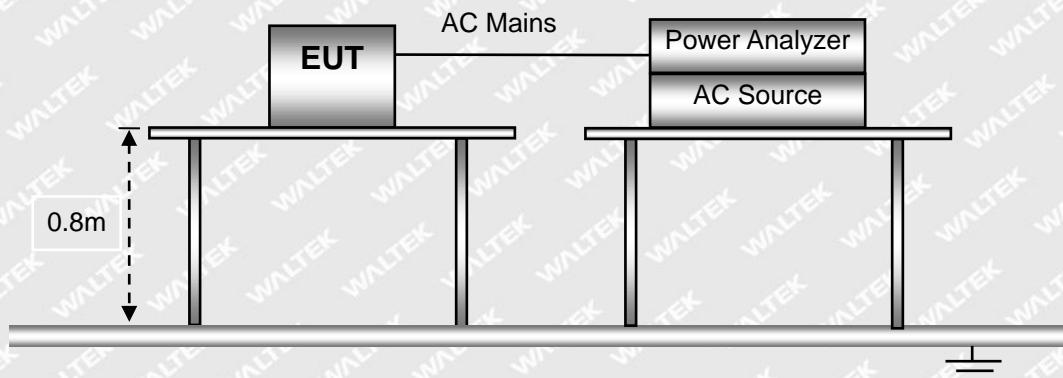


## 5. Harmonic Current Emissions

### 5.1 Test Procedure

Test is conducting under the description of EN IEC 61000-3-2.

### 5.2 Test Setup Block Diagram



### 5.3 Test Standards

EN IEC 61000-3-2, Clause 7.2 Limits for Class A equipment.

### 5.4 Environmental Conditions

Temperature:	26 °C
Relative Humidity:	55%
ATM Pressure:	1015 mbar

### 5.5 Harmonic Current Emissions Test Data

According to Clause 7 of EN IEC 61000-3-2, the EUT rated power is less than 75W, belong to 'equipment with a rated power of 75W or less', therefore 'limits are not specified in this edition of the standards'. It is deem to full fit the requirements of the standards.

Result: N/A

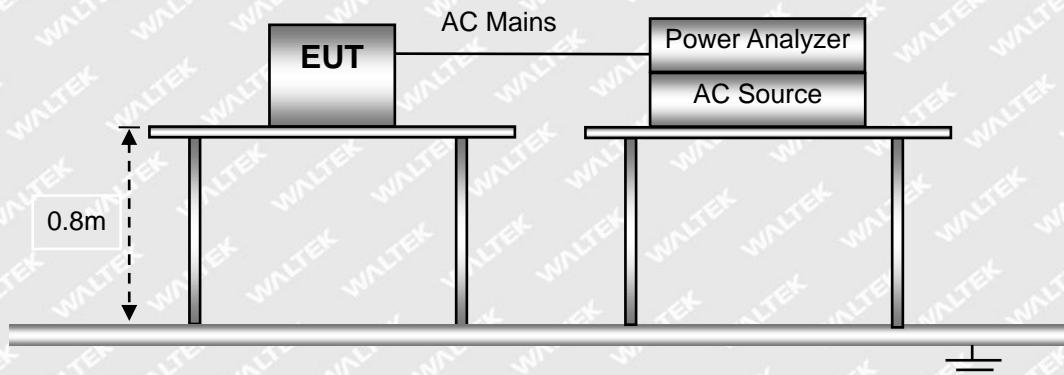


## 6. Voltage Fluctuation and Flicker

### 6.1 Test Procedure

Test is conducting under the description of EN 61000-3-3.

### 6.2 Test Setup Block Diagram



### 6.3 Test Standards

EN 61000-3-3, Limit: Clause 5.

### 6.4 Environmental Conditions

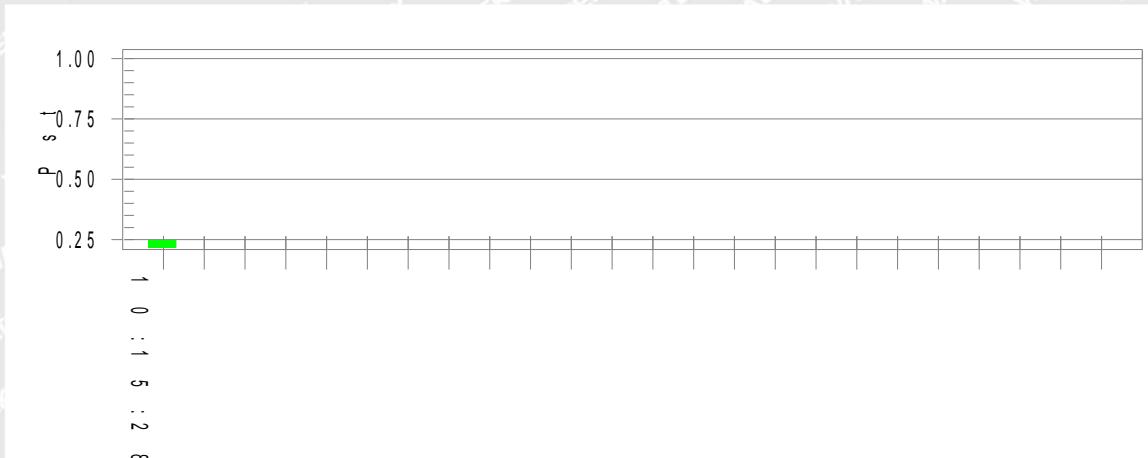
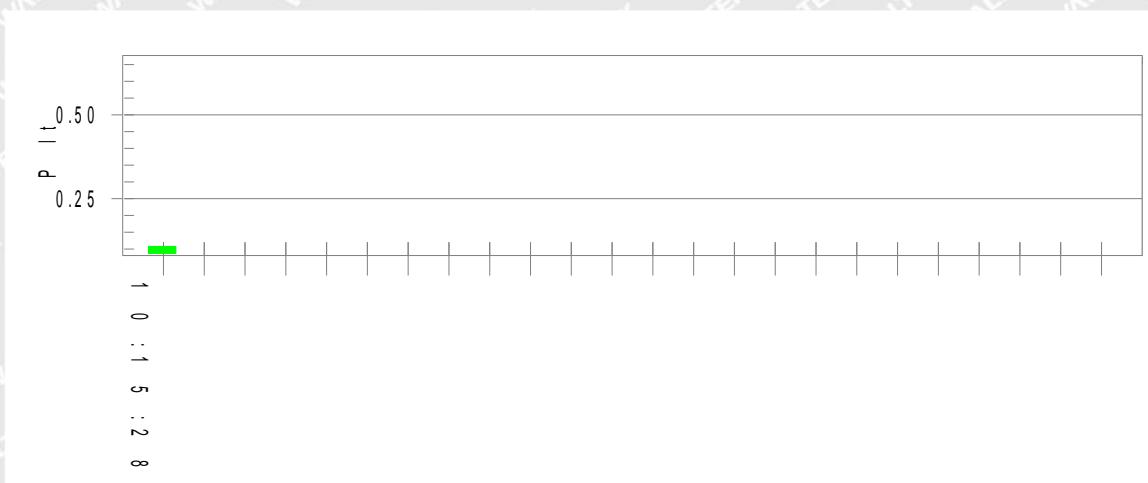
Temperature:	26 °C
Relative Humidity:	55%
ATM Pressure:	1015 mbar

### 6.5 Voltage Fluctuation and Flicker Test Data



Test mode:

TM2(worst case)

**Test Result: Pass****Status: Test Completed****Pst<sub>1</sub> and limit line****European Limits****Plt and limit line****Parameter values recorded during the test:**

Vrms at the end of test (Volt): 229.82

T-max (mS): 0

Test limit (mS): 500.0 Pass

Highest dc (%): 0.00

Test limit (%): 3.30 Pass

Highest dmax (%): 0.00

Test limit (%): 4.00 Pass

Highest Pst (10 min. period): 0.247

Test limit: 1.000 Pass

Highest Plt (2 hr. period): 0.108

Test limit: 0.650 Pass

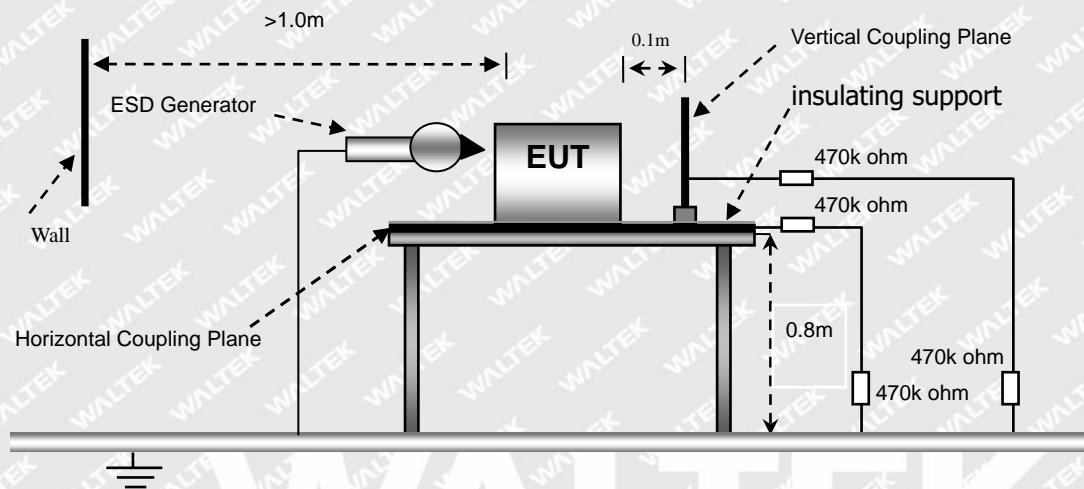


## 7. Electrostatic Discharge (ESD)

### 7.1 Test Procedure

Test is conducting under the description of EN 61000-4-2.

### 7.2 Test Setup Block Diagram



### 7.3 Test Performance

Required Performance Criterion:	B
Mode:	TM1-TM3
Note: TM2-TM3 for TT,TR	

### 7.4 Environmental Conditions

Temperature:	26 °C
Relative Humidity:	55%
ATM Pressure:	1011 mbar

### 7.5 Electrostatic Discharge Immunity Test Data



Test mode	TM1-TM3							
EN 61000-4-2 Test Points	Test Levels (kV)							
	-2	+2	-4	+4	-6	+6	-8	+8
Air Discharge								
Gap	A	A	A	A	A	A	A	A
Camera	A	A	A	A	A	A	A	A
Enclosure	A	A	A	A	A	A	A	A
Direct Contact Discharge								
/	/	/	/	/	/	/	/	/
Indirect Contact Discharge								
HCP (6 Sides)	A	A	A	A	/	/	/	/
VCP (4 Sides)	A	A	A	A	/	/	/	/

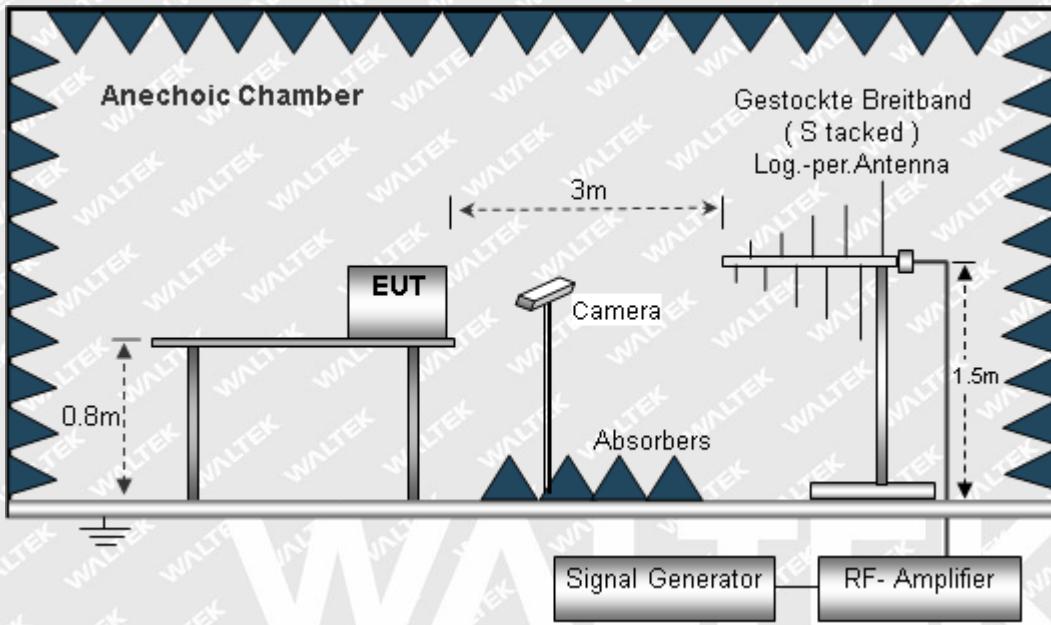
Test Result: Pass

## 8. Radio Frequency Electromagnetic Field (R/S)

### 8.1 Test Procedure

Test is conducting under the description of EN 61000-4-3.

### 8.2 Test Setup Block Diagram



### 8.3 Test Performance

Required Performance Criterion:	A
Mode:	TM1-TM3
Note: TM2-TM3 for CT,CR	

### 8.4 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	52%
ATM Pressure:	1010 mbar

### 8.5 Continuous Radiated Disturbances Test Data

Frequency step: 1% of fundamental

Dwell time: 1 second

Modulation: AM by 1kHz sine wave with 80% modulation depth



Test mode		TM1-TM3							
Frequency Range(MHz)	Field (V/m)	Front		Rear		Left Side		Right Side	
		VERT	HORI	VERT	HORI	VERT	HORI	VERT	HORI
80-1000	3	A	A	A	A	A	A	A	A
1000-3000	3	A	A	A	A	A	A	A	A
3000-6000	3	A	A	A	A	A	A	A	A

Test Result: Pass

# WALTEK



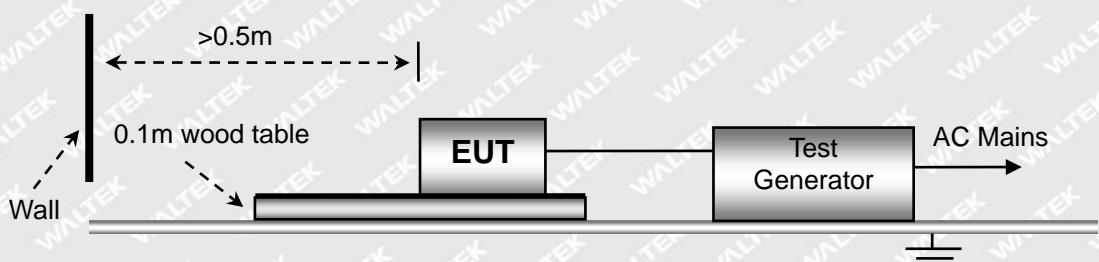
## 9. Fast Transients, Common Mode (EFT)

### 9.1 Test Procedure

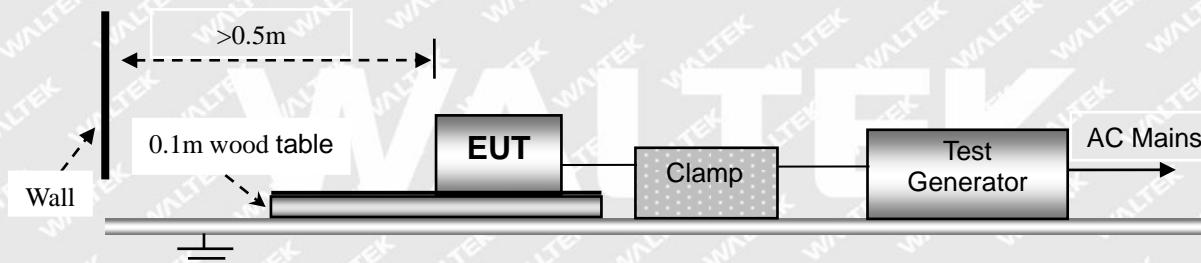
Test is conducting under the description of EN 61000-4-4.

### 9.2 Test Setup Block Diagram

For AC Mains or DC Ports:



For Signal or Telecommunication Ports:



### 9.3 Test Performance

Required Performance Criterion:	B
Mode:	TM1-TM3
Note: TM2-TM3 for TT,TR	

### 9.4 Environmental Conditions

Temperature:	22 °C
Relative Humidity:	53%
ATM Pressure:	1011 mbar

### 9.5 Electrical Fast Transients Test Data



Test Mode		TM1-TM3							
EN 61000-4-4 Test Line		Test Levels (kV)							
		+0.5	-0.5	+1.0	-1.0	+2.0	-2.0	+4.0	-4.0
AC Main Power port	L	A	A	A	A	/	/	/	/
	N	A	A	A	A	/	/	/	/
	PE	/	/	/	/	/	/	/	/
	L-N	A	A	A	A	/	/	/	/
	L-PE	/	/	/	/	/	/	/	/
	N-PE	/	/	/	/	/	/	/	/
	L-N-PE	/	/	/	/	/	/	/	/
Signal ports	/	/	/	/	/	/	/	/	/

Test Result: Pass



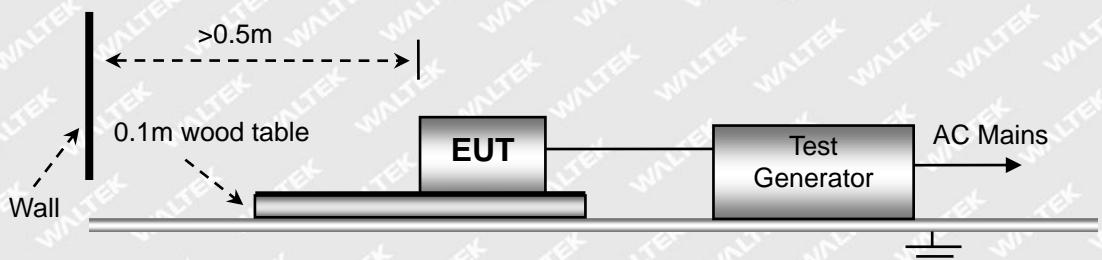
## 10. Surges

### 10.1 Test Procedure

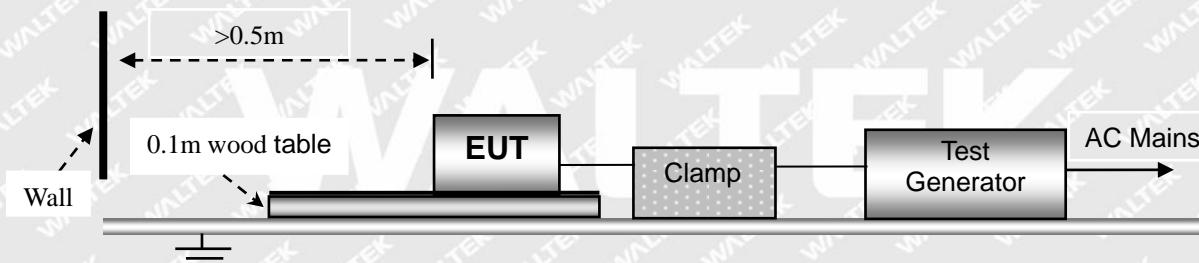
Test is conducting under the description of EN 61000-4-5.

### 10.2 Test Setup Block Diagram

For AC Mains or DC Ports:



For Signal or Telecommunication Ports:



### 10.3 Test Performance

Required Performance Criterion:	B
Mode:	TM1-TM3
Note: TM2-TM3 for TT,TR	

### 10.4 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	53%
ATM Pressure:	1011 mbar

### 10.5 Surge Test Data



Test Mode	TM1-TM3			
Voltage	Poll	Path	Pass	Fail
0.5kV	±	L-N	A	/
1kV	±	L-N	A	/
2kV	±	L-N, L-PE, N-PE	/	/
4kV	±	L-N, L-PE, N-PE	/	/

Test Result: Pass



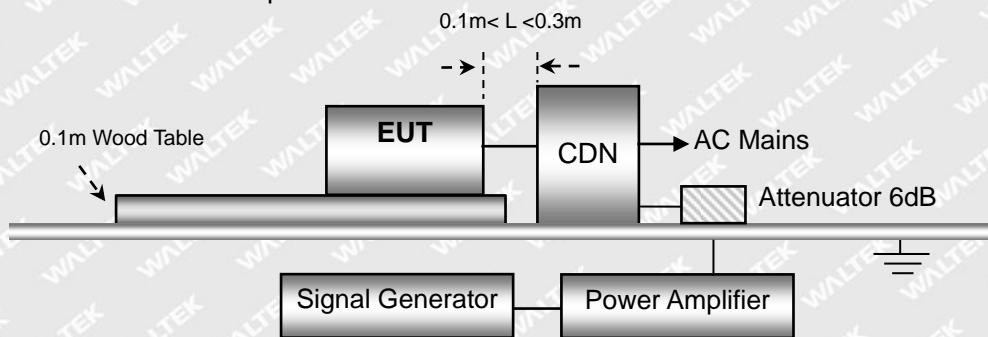
## 11. Radio Frequency, Common Mode (C/S)

### 11.1 Test Procedure

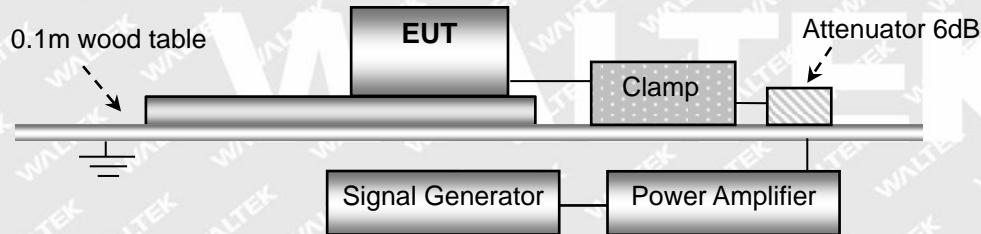
Test is conducting under the description of EN 61000-4-6.

### 11.2 Test Setup Block Diagram

For AC Mains or DC Input:



For Signal or Telecommunication Ports:



### 11.3 Test Performance

Required Performance Criterion:	A
Mode:	TM1-TM3
Note: TM2-TM3 for CT,CR	

### 11.4 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	53%
ATM Pressure:	1011 mbar

### 11.5 Continuous Conducted Disturbances Test Data

Sweep frequency range: 150kHz~80MHz

Frequency step: 1% of fundamental

Dwell time: 1 second



Test Mode		TM1-TM3		
Level	Voltage (V) (rms, unmodulated)	Modulation:	Pass	Fail
1	1	AM 80%, 1kHz sinewave	/	/
2	3	AM 80%, 1kHz sinewave	A	/
3	10	AM 80%, 1kHz sinewave	/	/
X	Special	/	/	/

Test Result: Pass

# WALTEK

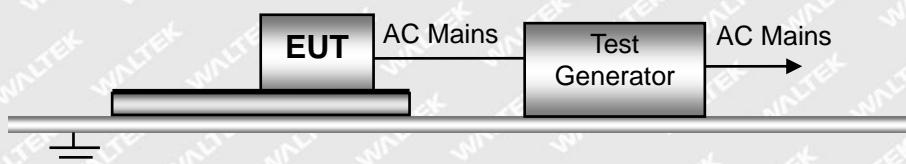


## 12. Voltage Dips and Interruptions

### 12.1 Test Procedure

Test is conducting under the description of EN 61000-4-11.

### 12.2 Test Setup Block Diagram



### 12.3 Test Performance

Required Performance Criterion:	B for voltage dip/ C for voltage interruption
Mode:	TM1-TM3
Note: TM2-TM3 for TT,TR	

### 12.4 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	50%
ATM Pressure:	1011 mbar

### 12.5 Voltage Dips And Interruptions Test Data

U: Voltage dips in % U<sub>T</sub> (U<sub>T</sub> is rated voltage for the EUT)

T: Test duration

Level	U	T	Phase Angle	N	Pass	Fail
1	100%	10ms	0/90/180/270	3	A	/
2	100%	20ms	0/90/180/270	3	B	/
3	30%	500ms	0/90/180/270	3	B	/
4	100%	5000ms	0/90/180/270	3	C	/

Test Result: Pass



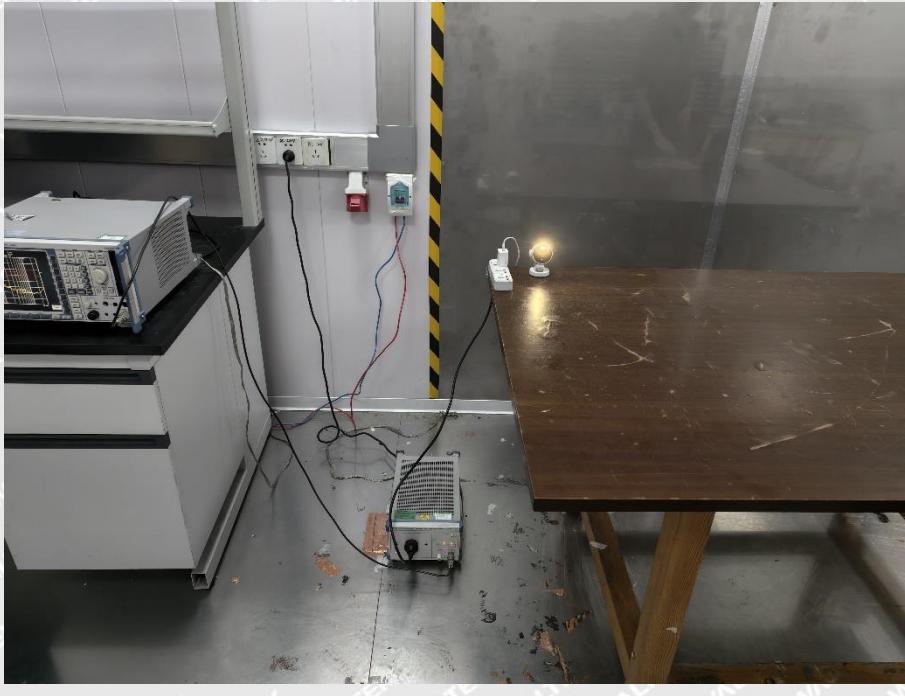
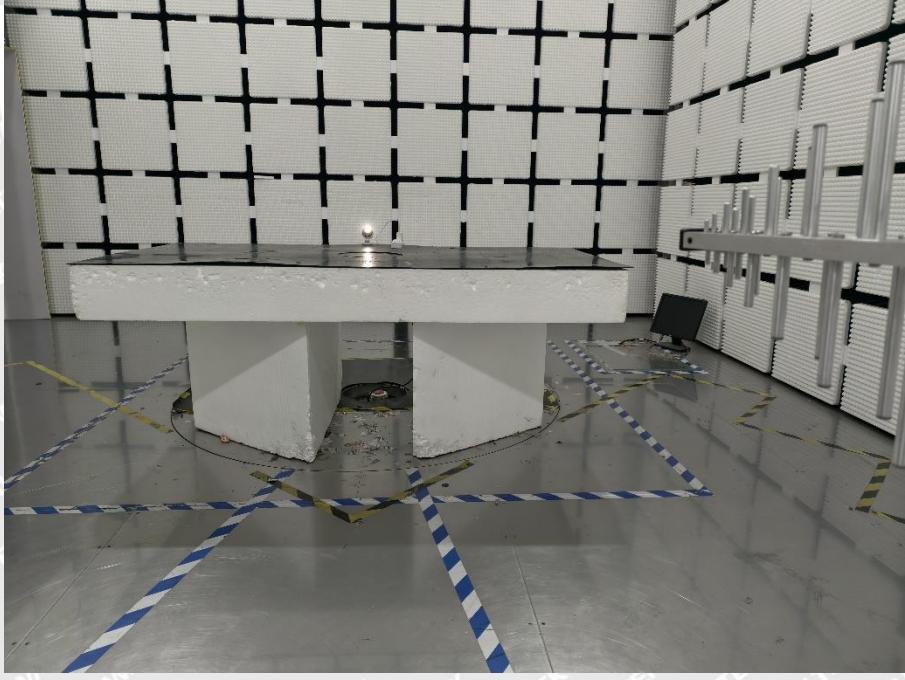
## EXHIBIT 1 - EUT PHOTOGRAPHS

---

Please refer to "ANNEX".

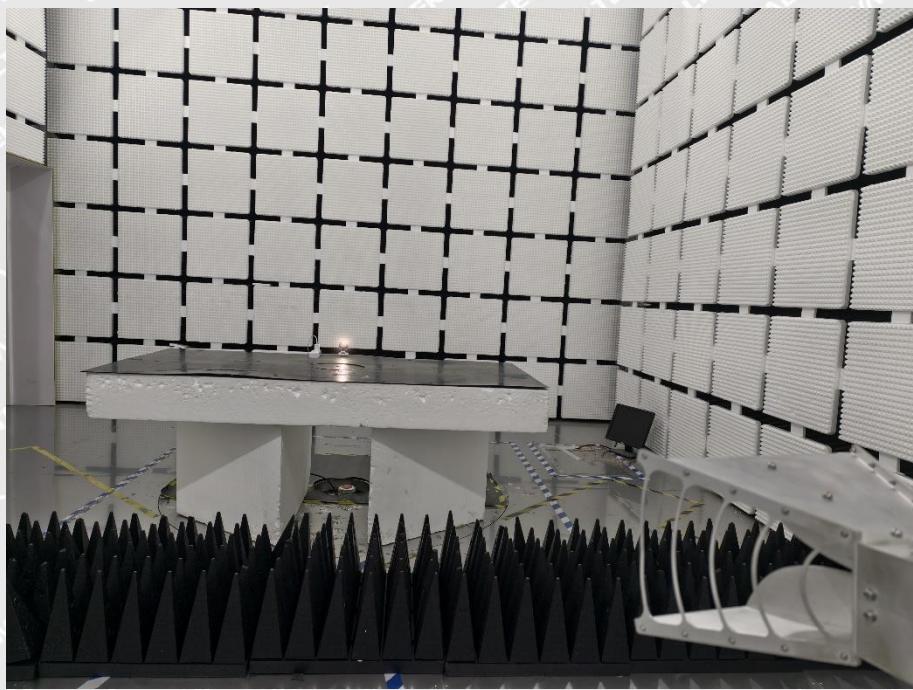
**WALTEK**

## EXHIBIT 2 - TEST SETUP PHOTOGRAPHS

<p><b>Conducted Emission Test Setup</b></p>	 A photograph showing a conducted emission test setup. On the left, a grey metal cabinet houses electronic equipment, with a blue and white signal generator on top. A black power strip is connected to the cabinet and a vertical yellow and black striped safety post. A red button is mounted on the wall next to the post. A small glowing device sits on a wooden table to the right. Cables from the equipment run across the floor.
<p><b>Radiation Emission Test View(30MHz to 1GHz)</b></p>	 A photograph of a radiation emission test chamber. The central area is a white rectangular platform supported by a central column. The walls of the chamber are covered in a grid of black crosses, likely absorbers. The floor is marked with blue and white diagonal caution tape forming a triangular pattern. A computer monitor is visible on the right side of the chamber.



**Radiation Emission  
Test Setup ((Above  
1GHz))**



**Harmonic/Flicker Test  
View**

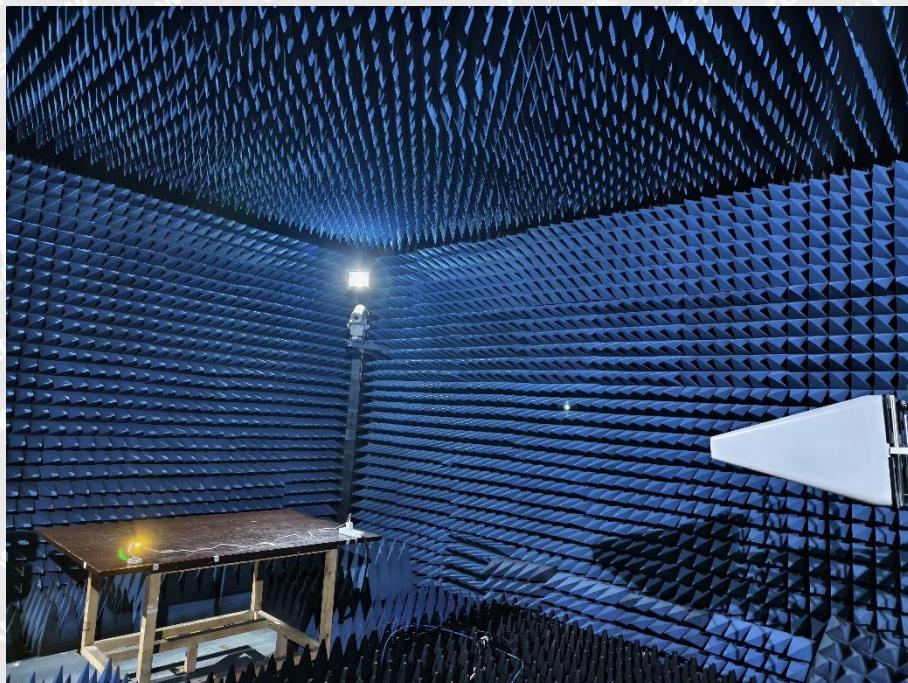




**EN 61000-4-2 Test View**



**EN 61000-4-3 Test View**



**EN 61000-4-4 Test View****EN 61000-4-5 Test View**



**EN 61000-4-11 Test  
View**



**EN 61000-4-6 Test View**



\*\*\*\*\* END OF REPORT \*\*\*\*\*